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VISTEON
C/O BRINKS HOFER GILSON & LIONE
PO BOX 10395
CHICAGO, IL 60610

EXAMINER	
CHOW, CHARLES CHIANG	
ART UNIT	**PAPER NUMBER**
2685	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/040,857	Applicant(s) WHIKEHART ET AL.	
	Examiner Charles Chow	Art Unit 2685	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 9-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 9-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Detailed Action

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-3, 9-11, 14-15, 17-19, 22, 24-25, 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strenglein (US 3,864,633) in view of Akaiwa et al. (US 5, 710,995) and Baltus et al. (US 5,887,247).

Regarding **claim 1**, Strenglein teaches a radio receiver [Fig. 6] comprising a first mixer circuit [hybrid circuit 61 producing sum & difference, col. 5, lines 36-39] operable to generate a receiver signal from first and second signals [61 receiving down converted signal from power divider 55 and power divider 54 via phase shifter 57, Fig. 6],

the receiver signal characterized by a receiver signal quality [the evaluating of best signal to noise characteristics, col. 5, lines 56-65], and

a second mixer circuit [hybrid 60 producing sum & difference] operable to generate a test signal from a different combination of the first and second signals [the testing the signal 64, 65, with the result of better SNR on 68 to control phase setting in 57, which causes corresponding sum, difference signals 62, 63 to be used, col. 5, lines 44-65], the test signal characterized by a test signal quality [the evaluation of SNR performed by diversity selector 66. col. 5, lines 56-65].

Strenglein teaches the testing of the signals 64, 65 for the exceeding the receiver quality SNR [col. 5, lines 51-65].

Strenglein fail to teach the first mixer circuit is operable to reset a proportion of the first and second signals for the receiver signal in response to the different proportion of the first and second signals of the test signal.

Akaiwa et al. (Akaiwa) teaches these features, the first mixer circuit [33, 34] is operable to reset a proportion of the first and second signals for the receiver signal in response to the different proportion of the first and second signals of the test signal [the resetting, updating weighting w1, w2, in T cycle time, for the combining antenna signals x1(t), x2(t), based on the proportion equations in col. 3, lines 1-25, to form a test signal y(t); col. 2, line 50 to col. 3, line 43], to improve quality by reducing distortion [col. 3, lines 26-43], in order to resetting, recombine, the antenna signals for better quality, based on the different proportion weighting W1, W2. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein with Akaiwa's proportion weight W1 & W2, in order to recombine the antenna signals with W1, W2, for better quality.

Strenglein & Akaiwa fail to teach the vehicle radio. Baltus et al. (Baltus) teaches the mobile car radio [mobile, car radio, GPS in col. 1, lines 8-16], in order to provide better signal quality for the antenna steering of mobile ratio [col. 2, lines 6-10]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein, Akaiwa with Baltus' mobile radio, in order to provide better signal quality for the antenna steering of mobile radio.

Regarding **claim 2**, Strenglein teaches where a second mixer circuit [hybrid 60 producing sum & difference] operable to generate a test signal from a different combination of the first and second signals [the testing the combination of 64, 65, with the result of better SNR on 68 to control phase setting in 57, which causes corresponding sum, difference signals 62, 63 to be used, col. 5, lines 44-65], the test

signal characterized by a test signal quality [the evaluation of signal to noise ratio performed by diversity selector 66. col. 5, lines 56-65].

Strenglein teaches the first mixer circuit is operable to rest the receiver signal in response to the new combination when the new test signal quality exceeds the receiver signal quality [the testing of the signals 64, 65, exceeds the receiver quality SNR [col. 5, lines 51-65], then to use the combined signal from 62, 63 after testing 64, 65.

Strenglein fails to teach the new proportion of the first and second signal, the resetting the receiver signal in response to the new proportion.

Akaiwa teaches these features [the resetting, updating, combined signal y(t) with new weighting w1, w2, derived from equation, col. 2, line 50 to col. 3, line 43].

Regarding **claims 3, 11, 19, 25**, Akaiwa teaches the FM in about 88 MHz through about 108 MHz [the receiver detecting FM stereo signals in col. 4, lines 5-13; col. 45-54, for the obviously the FM signal is located in 88 to 108 MHz].

Regarding **claim 9**, Strenglein teaches a radio receiver [space diversity receiving system in Fig. 6] comprising a first mixer circuit [hybrid circuit 61 producing sum & difference, col. 5, lines 36-39] operable to generate a rf receiver signal [64, 65] characterized by a receiver steering solution [based on SNR via 68, col. 5, lines 50-65], the receiver steering solution representing a combination of a first rf signal and a second rf signal in the rf receiver signal [sum $ difference signals 64, 65 steered by 68],

a second mixer circuit [hybrid 60 producing sum & difference] operable to generate an rf test signal characterized by a test steering solution representing a combination of the first and second signals [the testing the combination of 64, 65, with the result of better SNR on 68 to control phase setting in 57, which causes corresponding sum,

difference signals 62, 63 to be used, col. 5, lines 44-65], the test signal characterized by a test signal quality [the test evaluation of SNR performed by diversity selector 66. col. 5, lines 56-65],

a first tuner [50] connected to the first mixer circuit [60], the first tuner operable to generate a receiver signal in response to the receiver signal [in response to the receiver signals 62, 63], the receiver signal having a receiver signal quality [the SNR evaluation in 66],

a second tuner [51] connected to the second mixer circuit [61] the second tuner operable to generate a receiver signal in response to the receiver signal [in response to the receiver signals 64, 65], the receiver signal having a receiver signal quality [the SNR evaluation in 66 to generate control signal 68],

Strenglein teaches the testing of the signals 64, 65 for the exceeding the receiver quality SNR [col. 5, lines 51-65].

Strenglein fail to teach the first mixer circuit is operable to reset the proportion of the first and second rf signal in the receiver signal in response to the proportion of the first rf and second rf signals of the rf test signal.

Akaiwa teaches these features, the first mixer circuit [33, 34] is operable to reset a proportion of the first and second signals for the receiver signal in response to the different proportion of the first and second signals of the test signal [the resetting, updating weighting w1, w2, in T cycle time, for the combining antenna signals x1(t), x2(t), based on the proportion equations in col. 3, lines 1-25, of the test signal y(t); col. 2, line 50 to col. 3, line 43], to improve quality by reducing distortion [col. 3, lines 26-43], in order to resetting, recombine, the antenna signals for better quality, based on the different proportion weighting W1, W2. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein with

Akaiwa's proportion weight W1 & W2, in order to recombine the antenna signals with W1, W2, for better quality.

Strenglein & Akaiwa fail to teach the vehicle radio. Baltus et al. (Baltus) teaches the mobile car radio [mobile, car radio, GPS in col. 1, lines 8-16], in order to provide better signal quality for the antenna steering of mobile ratio [col. 2, lines 6-10]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein, Akaiwa with Baltus' mobile radio, in order to provide better signal quality for the antenna steering of mobile radio.

Regarding **claim 10**, Strenglein teaches the where the second mixer 61 is operable to generate a new rf test signal [64, 65] in response to the new steering solution [the generating new rf test signal 64, 65 for better SNR in response to new test steering 68], Baltus teaches where the second tuner [22] is operable to generate a new test signal in response to the new rf test signal quality [22 generate new test signa at 31 for quality at 29 to steer phase shift at 26, Fig. 2], and

Akaiwa teaches where the first mixer circuit 33, 34, operable to reset the rf receiving in response to the new test steering solution when the new test signal quality exceeds the receiver signal quality [resetting, updating w1, w2, for combining x(1), x(2) when the quality, distortion is exceeding receiver quality, col. 2, line 50 to col. 3, line 43].

Regarding **claim 14,** Strenglein teaches the where the first and second mixers 60, 61] are configured to receive the first rf signal from a first antenna [10], and the second rf signal from a second antenna [11, via the power divider 54, 55, Fig. 6]; the first and second antennas are disposed at different positions [spaced apart antennas in col. 2, lines 16-17].

Regarding **claim 15,** Strenglein teache the at least one of the receiver signal quality SNR and the test signals quality for 64, 65 comprising at least one of a signal strength and a signal noise [the testing of signal quality SNR in col. 5, lines 50-65].

Regarding **claim 17**, Strenglein teaches a beamsteering control in radio receiver [beam steering from 67, 68 in Fig. 6, of a space diversity receiving system in Fig. 6], generate a receiver signal from first and second signals where the receiver signal has a receiver signal quality [generating receiver signal 62-65 from first and second antenna signal at 10, 11; having a quality SNR tested by 66],

generating a test signal in response to a first test steering solution where the first test steering solution represents a combination of a first and second radio signals in the test signal [the testing the signal 64, 65, with the result of better SNR on 68 to control phase setting in 57, which causes corresponding sum, difference signals 62, 63 to be used, col. 5, lines 44-65], where the test signal has a test signal quality [the evaluation of SNR performed by diversity selector 66. col. 5, lines 56-65].

Strenglein teaches the testing of the signals 64, 65 for the exceeding the receiver quality SNR [col. 5, lines 51-65].

Strenglein fail to teach the proportion of first and second signal, and resetting a proportion of the first and second radio signal in the receiver signal to generate the receiver signal in response to the proportion of the first and second signals of the test signal.

Akaiwa teaches these features, the first mixer circuit [33, 34] is operable to reset a proportion of the first and second signals for the receiver signal in response to the different proportion of the first and second signals of the test signal [the resetting, <u>updating weighting w1, w2,</u> in T cycle time, for the combining antenna signals x1(t), x2(t), based on the proportion equations in col. 3, lines 1-25, of the test signal y(t);

col. 2, line 50 to col. 3, line 43], to improve quality by reducing distortion [col. 3, lines 26-43], in order to resetting, recombine, the antenna signals for better quality, based on the different proportion weighting W1, W2. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein with Akaiwa's proportion weight W1 & W2, in order to recombine the antenna signals with W1, W2, for better quality.

Strenglein & Akaiwa fail to teach the vehicle radio. Baltus et al. (Baltus) teaches the mobile car radio [mobile, car radio, GPS in col. 1, lines 8-16], in order to provide better signal quality for the antenna steering of mobile ratio [col. 2, lines 6-10]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein, Akaiwa with Baltus' mobile radio, in order to provide better signal quality for the antenna steering of mobile radio.

Regarding **claim 18**, Baltus teaches the first and second radio signals comprising radio frequency RF signals, at antennas 3, 4 of the mobile phone [col. 3, lines 63-63; for TDMA, CDMA, in coll. 3, lines 7-14].

Regarding **claim 22**, Baltus teaches selecting a second test steering solution, generating a new test signal in response to the second test steering solution, the new test signal having a new test signal quality [the scanned quality is not better in step 133, the performing next scan direction & quality in step 134, to generate new test signal with new quality, and returning to step 133 for re-evaluating scan-better, Fig. 10, col. 7, lines 19-38].

Regarding **claim 24**, Strenglein teaches a method of beamsteering control in radio receiver [beam steering from 67, 68 in Fig. 6, of a space diversity receiving system in Fig. 6], generate a receiver signal in response to a first and second signals [generating receiver signal 62-65 from first and second antenna signal at 10, 11],

measuring a receiver signal quality of the receiver signal [test evaluate SNR of the signal quality 66, co.. 5, lines 51-65],

generating a first test steering solution [68] in response to the first radio signal measuring a first test signal quality of a first test signal responsive to the first test steering solution [Fig. 5, col. 5, lines 51-65],

Strenglein fail to teach the resetting a proportion of the first and second radio signal in the receiver signal to generate the receiver signal in response to a proportion of the first and second signals in the test signal.

Akaiwa teaches these features, the first mixer circuit [33, 34] is operable to reset a proportion of the first and second signals for the receiver signal in response to the different proportion of the first and second signals of the test signal [the resetting, updating weighting w1, w2, in T cycle time, for the combining antenna signals x1(t), x2(t), based on the proportion equations in col. 3, lines 1-25, of the test signal y(t); col. 2, line 50 to col. 3, line 43], to improve quality by reducing distortion [col. 3, lines 26-43], in order to resetting, recombine, the antenna signals for better quality, based on the different proportion weighting W1, W2. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein with Akaiwa's proportion weight W1 & W2, in order to recombine the antenna signals with W1, W2, for better quality.

Strenglein & Akaiwa fail to teach the vehicle radio. Baltus et al. (Baltus) teaches the mobile car radio [mobile, car radio, GPS in col. 1, lines 8-16], in order to provide better signal quality for the antenna steering of mobile ratio [col. 2, lines 6-10]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein, Akaiwa with Baltus' mobile radio, in order to provide better signal quality for the antenna steering of mobile radio.

Regarding **claim 28**, Baltus teaches generating a second test steering solution in response to the second radio signal [the phase shifted second scanning signal from phase shift 26 for continuously generating second test steering solution in steps 13, 134 Fig. 10; the continuous scanning in col. 2, lines 22-27], measuring a second test signal quality of a second test signal responsive to the second test steering solution [the next scan direction & quality in step 132], the resetting the receiver signal in response to the second test steering solution when the second test quality exceeds the receiver signal quality ["the scan better ?" of the second test steering in step 133, if it is better quality, swap beam 1 and beam 2 in step 135, otherwise move to next scan direction & test quality in step 134].

Strenglein teaches the testing of the signals 64, 65 for the exceeding the receiver quality SNR [col. 5, lines 51-65]. Akaiwa teaches the resetting the proportion of the first and second radio signal in response to the test steering solution [col. 2, line 50 to col. 3, line 43].

Regarding **claim 29**, Baltus teaches generating a third test steering solution in response to the first and second radio signals [the combined signal at combiner 25 for continuously generating second test steering solution in steps 13, 134 Fig. 10; the continuous scanning in col. 2, lines 22-27], measuring a third test signal quality of a second test signal responsive to the third test steering solution [the next scan direction & quality in step 132), the resetting the receiver signal in response to the third test steering solution when the third test quality exceeds the receiver signal quality [in the loop of 133, 134, "the scan better ?" of the third test steering in step 133, if it is better quality, swap beam 1 and beam 2 in step 135; otherwise move to next scan direction & test quality in step 134].

Strenglein teaches the testing of the signals 64, 65 for the exceeding the receiver quality SNR [col. 5, lines 51-65]. Akaiwa teaches the resetting the proportion of the first and second radio signal in response to the test steering solution [col. 2, line 50 to col. 3, line 43].

Regarding **claim 30**, Baltus teaches generating a new test steering solution in response to the first and second radio signals [the combined signal at combiner 25 for continuously generating second test steering solution in steps 13, 134 Fig. 10; the continuous scanning in col. 2, lines 22-27], measuring a new test signal quality of a second test signal responsive to the third test steering solution [the next scan direction & quality in step 132], the resetting the receiver signal in response to the new test steering solution when the third test quality exceeds the receiver signal quality (in the loop of 133, 134, "the scan better ?" of the third test steering in step 133, if it is better quality, swap beam 1 and beam 2 in step 135; otherwise move to next scan direction & test quality in step 134).

Strenglein teaches the testing of the signals 64, 65 for the exceeding the receiver quality SNR [col. 5, lines 51-65]. Akaiwa teaches the resetting the proportion of the first and second radio signal in response to the test steering solution [col. 2, line 50 to col. 3, line 43].

Regarding **claims 31, 32**, Strenglein teaches the testing of the signals 64, 65, exceeds the receiver quality SNR [col. 5, lines 51-65], then to use the signals from 62, 63 after testing the SNR. Akaiwa teaches the first mixer circuit operable to change the proportion of the first and second signal for generating the receiver signal by first mixer circuit based on, to match, the different proportion of the first and second signals and in response to the test signal [the resetting, updating, combined

signal y(t) with new weighting w1, w2, derived from equation, col. 2, line 50 to col. 3, line 43].

2. Claims 4-5, 12-13, 16, 20-21, 23, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strenglein in view of Akaiwa, Baltus, applied to claim 1 above, and further in view of Kuo et al. (US 6,064,865).

Regarding **claims 4, 13, 20, 27**, Strenglein, Baltus, Wildhagen fail to teach the radio data signals RDS. However, Kuo teaches the first and second rf signals comprise RDS signals [decoding of RDs signals at RDS decoder 34, from the signal output of summer 32, col. 3, lines 40-43, Fig. 5], the steering antenna weight for combining signals from antennas 24, 25, tuners 27-28, Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18], to reduce the adjacent channel interference [col. 1, line 22 to col. 2, line 9]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein above with Kuo's RDS signal, in order to receive better RDS information.

Regarding **claims 5, 12, 21, 26,** Kuo teaches the first and second signals comprise at least one of an intermediate frequency IF signal and a multiplex MPX signal [the down converted IF signals from tuner 27-28, Fig. 5, having the combining of MPX signals at combiner 32; the steering antenna weight for combining signals, Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18]. Strenglein teaches a receiver [Fig. 6] and test signals [64, 65].

Regarding **claims 16, 23**, Kuo teaches the signal processing circuit connected to the first mixer circuit, the signal processing circuit operable to generate an audio signal in response to the receiver signal [the audio processor 35 in Fig. 5, for producing stereo audio, col. 3, lines 43-49].

Response to Arguments

13. Applicant's arguments with respect to claims 1-5, 9-32 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's amendment based on the no teachings for the rest a proportion of the first and second signals for the receiver signal in response to the different proportion of the first and second signals of the test signal [applicant's amendment, pages 10-11], **Akaiwa et al. (US 5,710,995)** teaches the weighted combining of antenna signals x1(t), x2(t) to form signal y(t) [Fig. 3; col. 2, lines 50-65] controlled by a constant modulus algorithm CMA, to synthesize a corrected signal via the testing of the distortion, quality, of the y(t) [Fig. 3, Fig. 1, col. 2, line 15-24; col. 3, lines 25-43], to reset, update weighting w1, w2, in the update T cycle time [col. 3, lines 12-13] for the different proportion of the weighting values for w1, w2 to combine the antenna signals x1(t), x2(t) according to the different proportion weighting equation for w1, w2, of the CMA [col. 2, line 66 to col. 3, line 25; different proportion in col. 3, lines 15-25], to improve quality by reducing distortion [col. 3, lines 26-43].

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 703-

872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow C.C.

November 2, 2005.

EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600